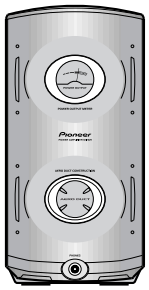
Service Manual



ORDER NO.
RRV2143

STEREO POWER AMPLIFIER

M-IS21

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	M-IS21		
KUCXJ	◯	AC120V	

- **This product is a component of a system.**
  For the accessories, instruction manuals etc., refer to the service manuals RRV2149 for XC-IS21MD and RRV2148 for XC-IS21T.
- **This product does not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component(s), otherwise damage may result.**

Component	System		Service Manual	Remarks
	IS-21MD	IS-21T		
CD MD TUNER	XC-IS21MD	——	RRV2149	
CD TUNER DECK	——	XC-IS21T	RRV2148	
STEREO POWER AMPLIFIER	M-IS21	M-IS21	RRV2143	This Service Manual
SPEAKER SYSTEM	S-IS21	S-IS21	RRV2141	

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T – ZZK MAY. 1999 Printed in Japan

1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

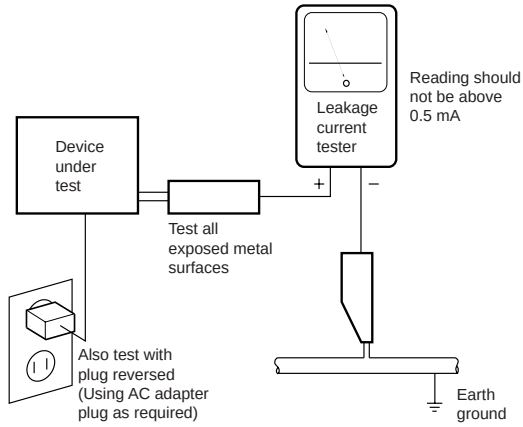
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5 mA.


Reading should not be above 0.5 mA
Leakage current tester
Device under test
+
–
Test all exposed metal surfaces
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

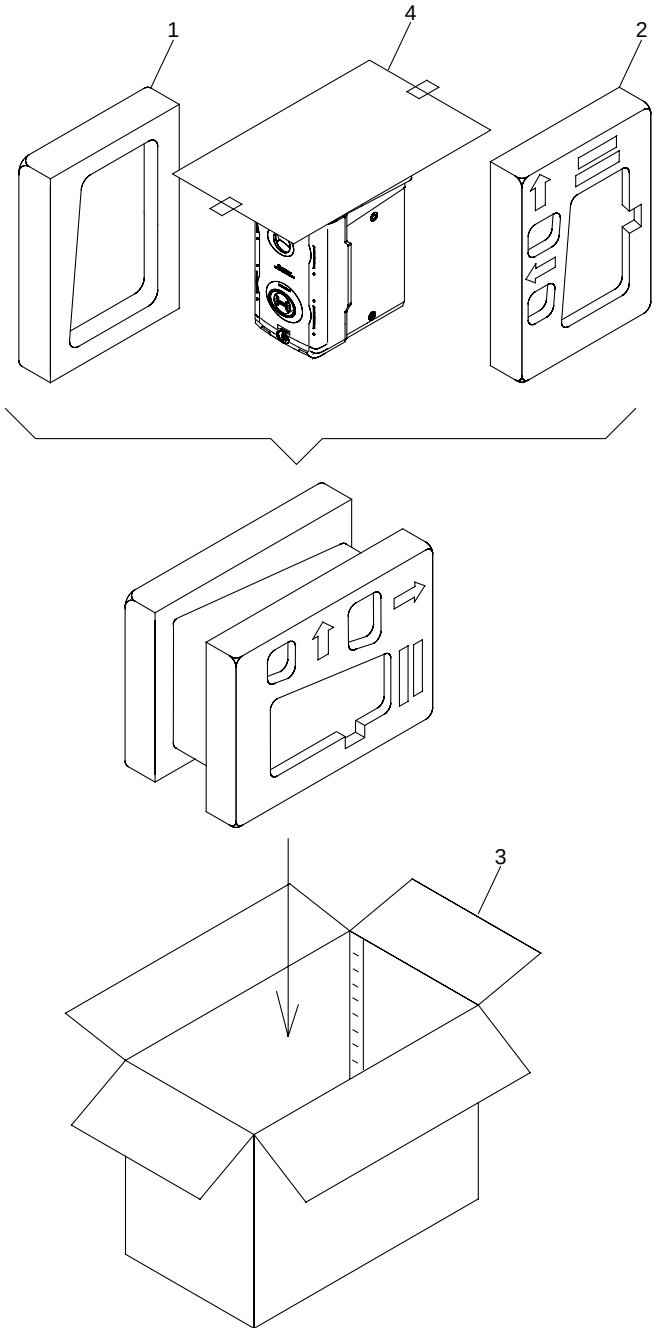
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS AND PARTS LIST

NOTES: ● *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
● *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
● *Screws adjacent to ▼ mark on product are used for disassembly.*

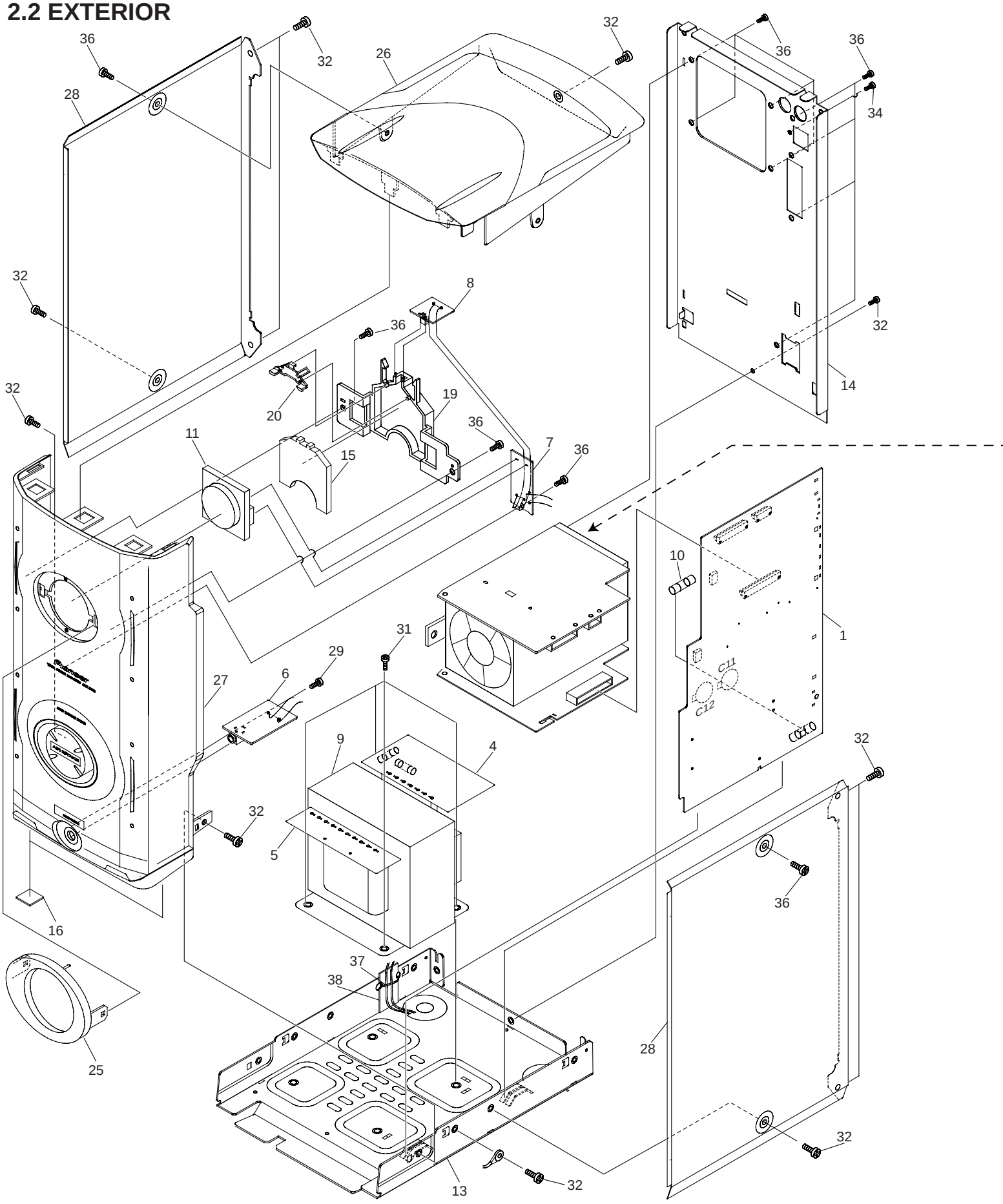
2.1 PACKING



● PACKING PARTS LIST

Mark	No.	Description	Part No.
	1	Side Pad AL	AHA7238
	2	Side Pad AR	AHA7239
	3	Packing Case AMP MY	AHD7748
	4	Packing Sheet	AHG7053

2.2 EXTERIOR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19
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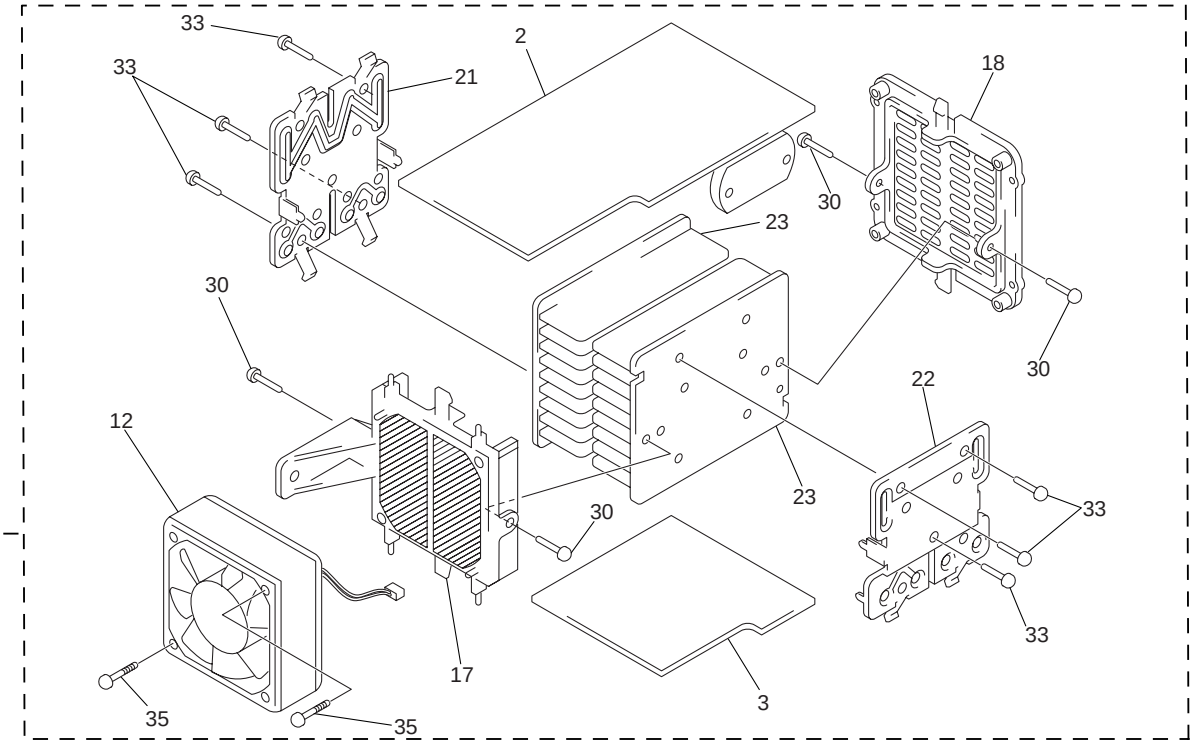
11
15
36
7
36
10
1
31
29
6
27
C11
C12
9
4
32
32
5
16
36
37
38
28
25
32
13
32

Caution when disassemble.
Even if the power supply code is pulled out from the outlet, neither C11 nor C12 of AF ASSY are discharged.
Please discharge C11 and C12 of AF ASSY by the resistor of 100 Ω or more before removing AF ASSY or POWER SUPPLY ASSY.
There is a possibility to destroy the transistor, and Please discharge by the resistor of 100 Ω or more.



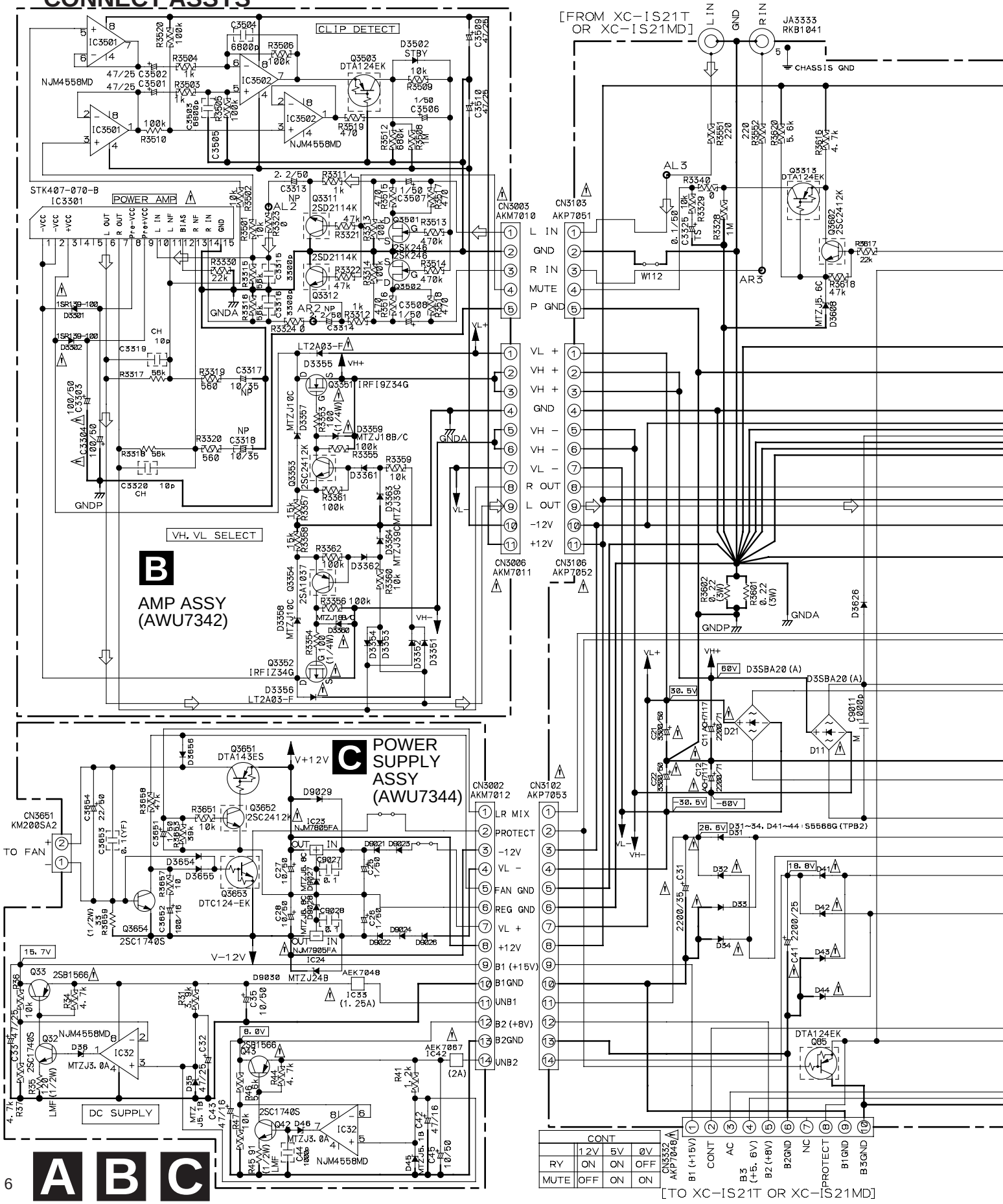
● EXTERIOR PARTS LIST

Mark	No.	Description	Part No.
	1	AF Assy	AWU7343
	2	AMP Assy	AWU7342
	3	POWER SUPPLY Assy	AWU7344
NSP	4	PRIMARY Assy	AWU7348
NSP	5	SECONDARY Assy	AWU7350
	6	HP Assy	AWU7352
	7	METER Assy	AWU7353
	8	METER CONNECT Assy	AWU7356
	9	Power Transformer	ATS7250
⚠	10	Fuse (FU1 : 5A)	REK1067
	11	VU Meter	AAW7002
	12	DC FAN Motor	AXM7003
NSP	13	Chassis A	ANA7086
	14	Rear Panel	ANC7824
	15	Lens A	AAK7614
	16	Rubber Sheet	AEB1111
	17	Mold A	AMR7005
	18	Mold B	AMR7006
	19	Lens Holder A	AMR7245
	20	Refrector	AMR7248
	21	Holder	ANG7009
	22	Power PAC Holder	ANG7109
	23	Heat Sink	ANH7058
	24	• • • • •	
	25	Escutcheon A	AAK7617
	26	Top Panel	AAN7192
	27	Front Panel A	AMB7564
	28	Side Bonnet	ANE7242
	29	Screw With Washer	ABA1005
	30	Screw	ABA1021
	31	Screw	FBT40P060FZK
	32	Screw	BBZ30P080FMC
	33	Screw	BBZ30P180FMC
	34	Screw	BMZ30P060FZK
	35	Screw	BPZ30P350FZK
	36	Screw	VPZ30P080FMC
	37	Binder	ZCA-SKB90BK
NSP	38	BIND Assy	AWU7349

Caution :
Be careful when No.10 Fuse(FU1:5A) is exchanged.
Please remove No.32 Screw of Rear Panel, remove No.1 AF Assy backward with No.14 Rear Panel, and exchange No.10 Fuse(FU1:5A).
(Fuse Caution is displayed in SIDE B of No.1 AF Assy.)

3. SCHEMATIC DIAGRAM

3.1 AF, AMP, POWER SUPPLY, PRIMARY, SECONDARY, HP, METER and METER CONNECT ASSYS



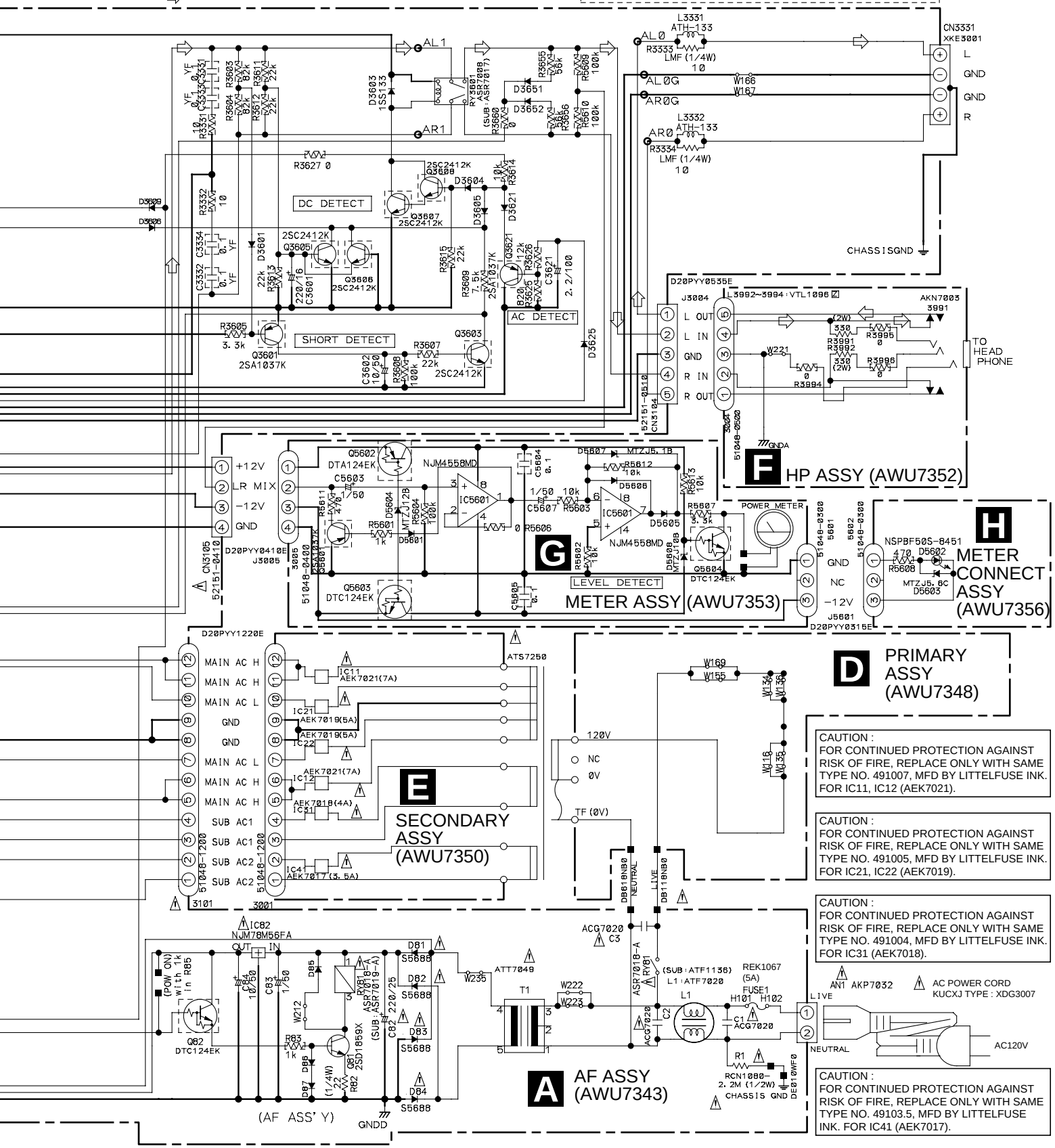
CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE NO. 491002F, MFD BY LITTELFUSE INK. FOR IC42 (AEK7067).

CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE NO. 4911.25, MFD BY LITTELFUSE INK. FOR IC33 (AEK7048).

⇨ : AUDIO SIGNAL ROUTE

Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST"

NOTES
1. RESISTORS indicated in Ω, 1/10W±5% tolerance unless otherwise noted k:kΩ, M:MΩ.
2. CAPACITORS indicated in capacity(uF)/voltage(V) unless otherwise noted p:pF.
3. DIODES No mark diode is 1SS133.



CAUTION :
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE NO. 491007, MFD BY LITTELFUSE INK. FOR IC11, IC12 (AEK7021).

CAUTION :
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE NO. 491005, MFD BY LITTELFUSE INK. FOR IC21, IC22 (AEK7019).

CAUTION :
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE NO. 491004, MFD BY LITTELFUSE INK. FOR IC31 (AEK7018).

CAUTION :
FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE NO. 49103.5, MFD BY LITTELFUSE INK. FOR IC41 (AEK7017).

AN1 AKP7032 AC POWER CORD KUCXJ TYPE : XDG3007

• NOTE FOR FUSE REPLACEMENT

CAUTION - FOR CONTINUED PROTECTION AGAINST RISK OF FIRE. REPLACE WITH SAME TYPE AND RATINGS ONLY.

4. PCB CONNECTION DIAGRAM

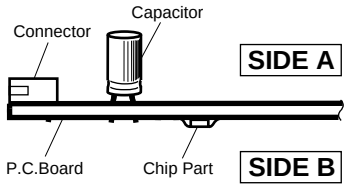
NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

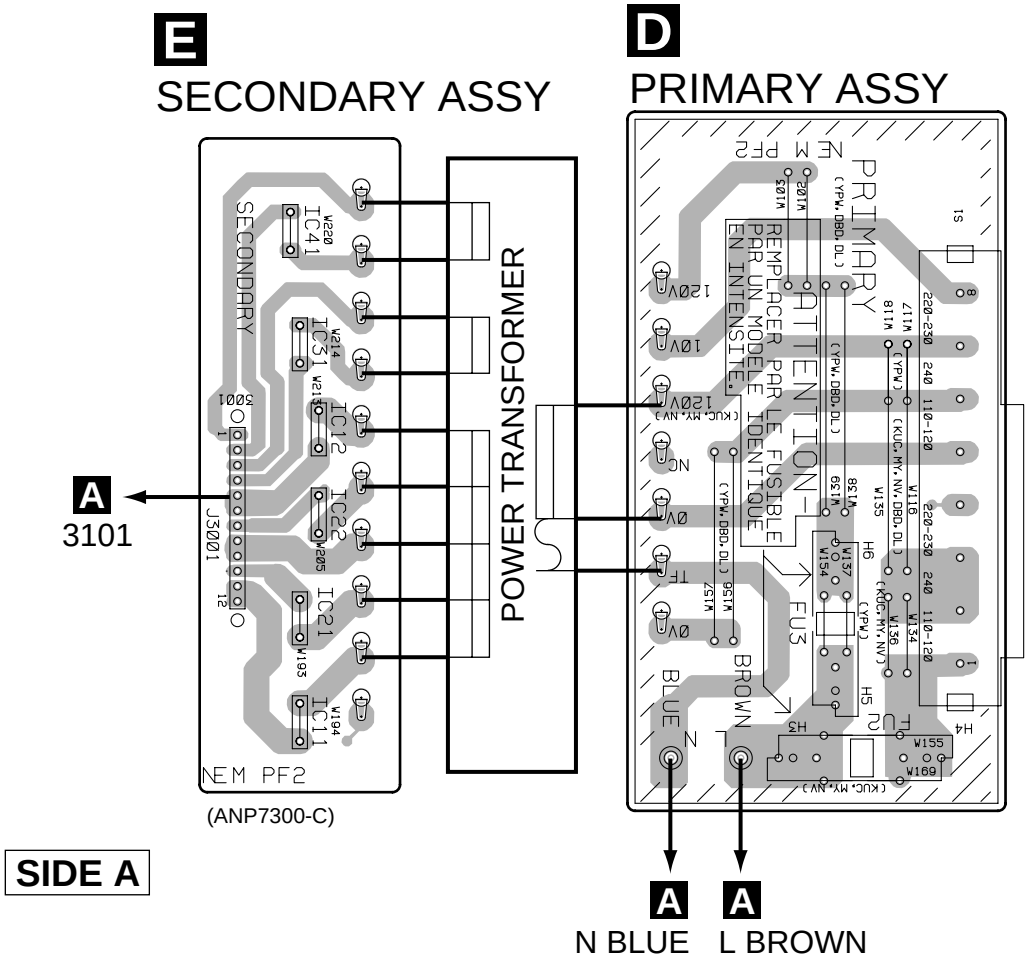
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.

4. Viewpoint of PCB diagrams

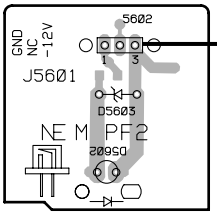


4.1 PRIMARY and SECONDARY ASSYS

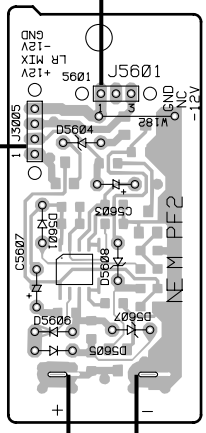


4.2 HP, METER and METER CONNECT ASSYS

H
METER
CONNECT
ASSY



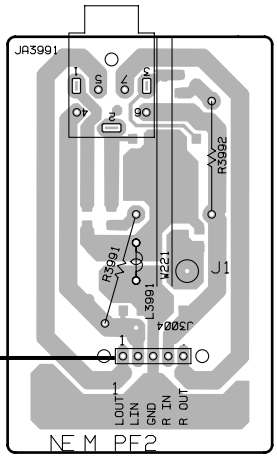
G
METER ASSY



A CN3105

POWER METER

F
HP ASSY

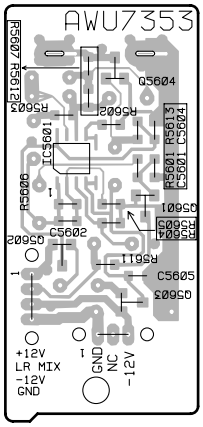


A CN3104

(ANP7300-C)

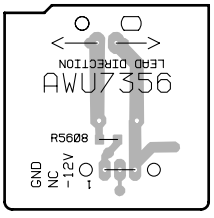
SIDE A

G
METER ASSY

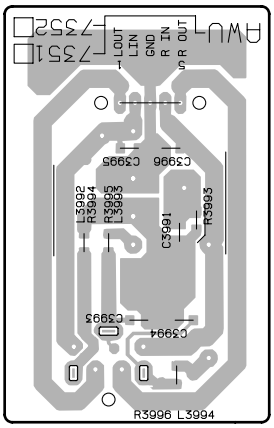


Q5604
IC5601
Q5601
Q5602
Q5603

H
METER
CONNECT
ASSY



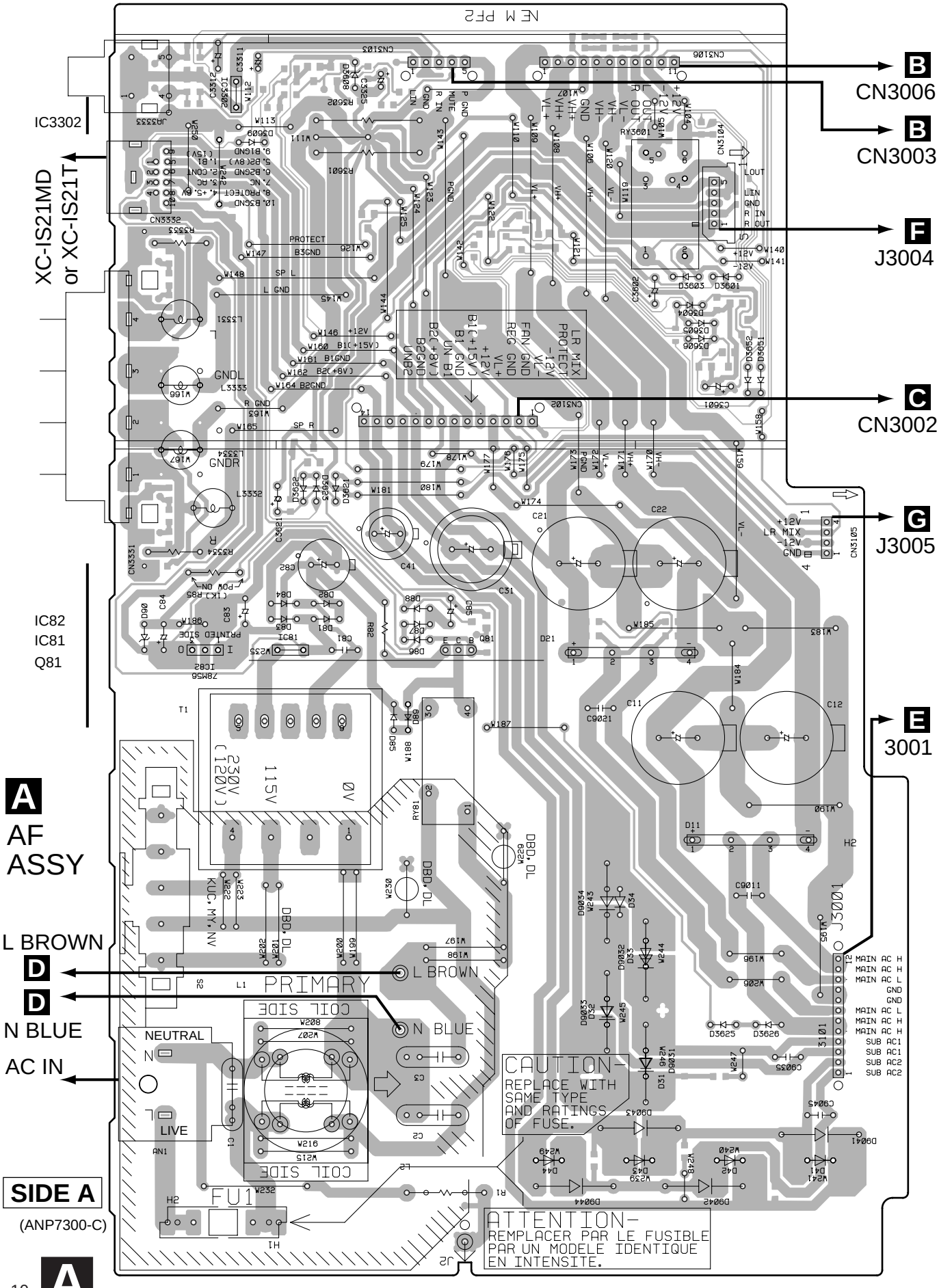
F
HP ASSY



(ANP7300-C)

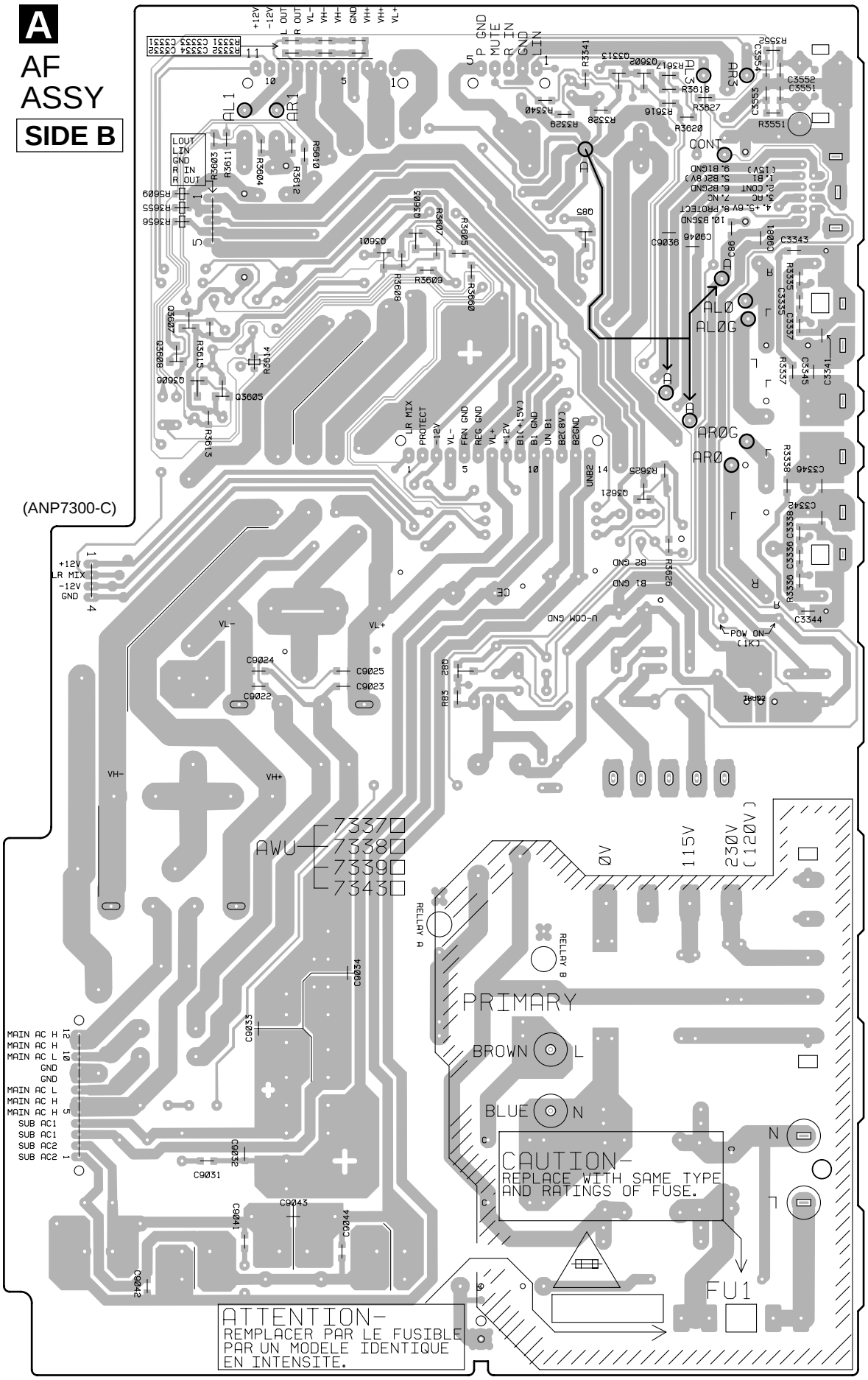
SIDE B

4.3 AF ASSY


IC3302
XC-IS21MD
or XC-IS21T
IC82
IC81
Q81
L BROWN
N BLUE
AC IN
NEUTRAL
LIVE
PRIMARY
L BROWN
N BLUE
COIL SIDE
COIL SIDE
CAUTION-
REPLACE WITH
SAME TYPE
AND RATINGS
OF FUSE.
ATTENTION-
REMPLACER PAR LE FUSIBLE
PAR UN MODELE IDENTIQUE
EN INTENSITE.
CN3006
CN3003
J3004
CN3002
J3005
3001
J3001
MAIN AC H
MAIN AC H
MAIN AC L
GND
GND
MAIN AC L
MAIN AC H
MAIN AC H
SUB AC1
SUB AC1
SUB AC2
SUB AC2
A
AF
ASSY
SIDE A
(ANP7300-C)

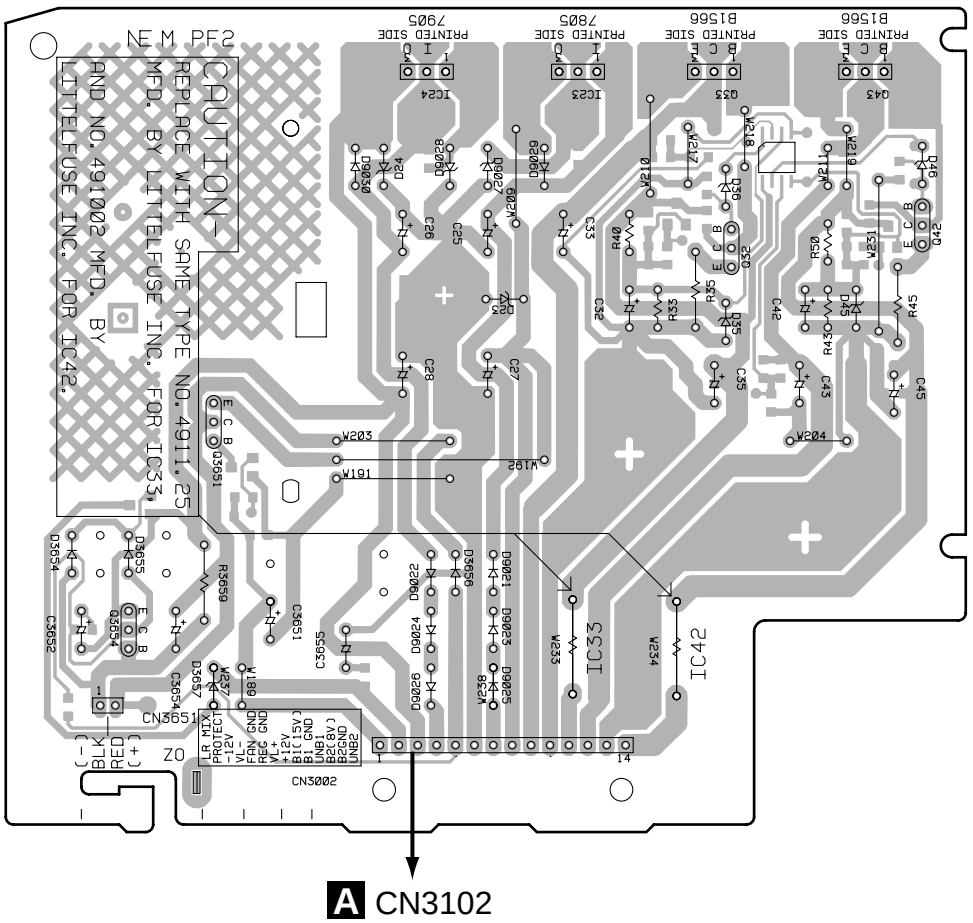
A
AF ASSY
SIDE B

(ANP7300-C)



4.4 AMP and POWER SUPPLY ASSYS

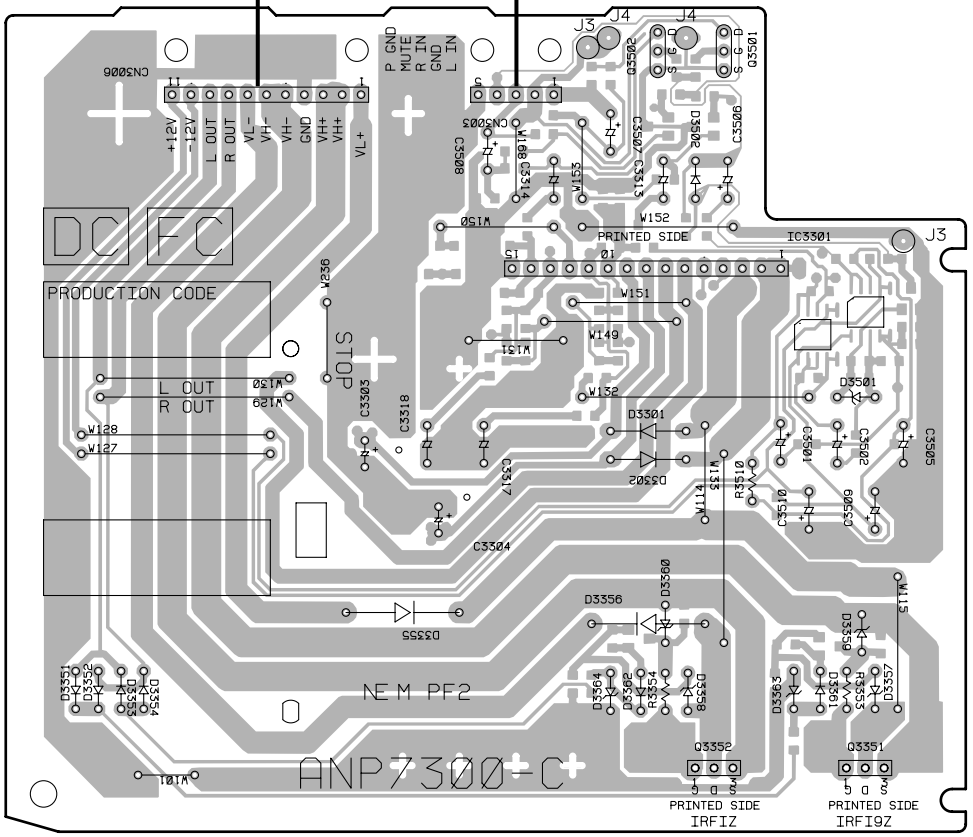
C
POWER SUPPLY ASSY



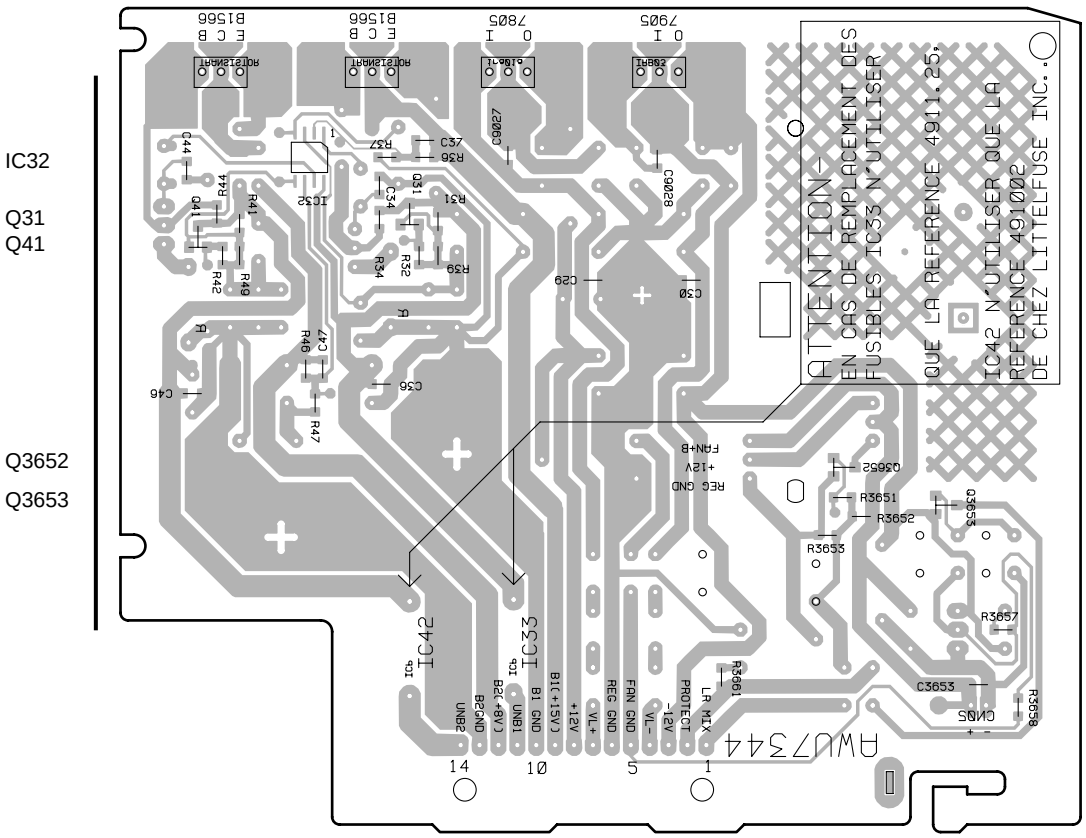
A CN3102

A CN3106 **A** CN3103

B
AMP ASSY

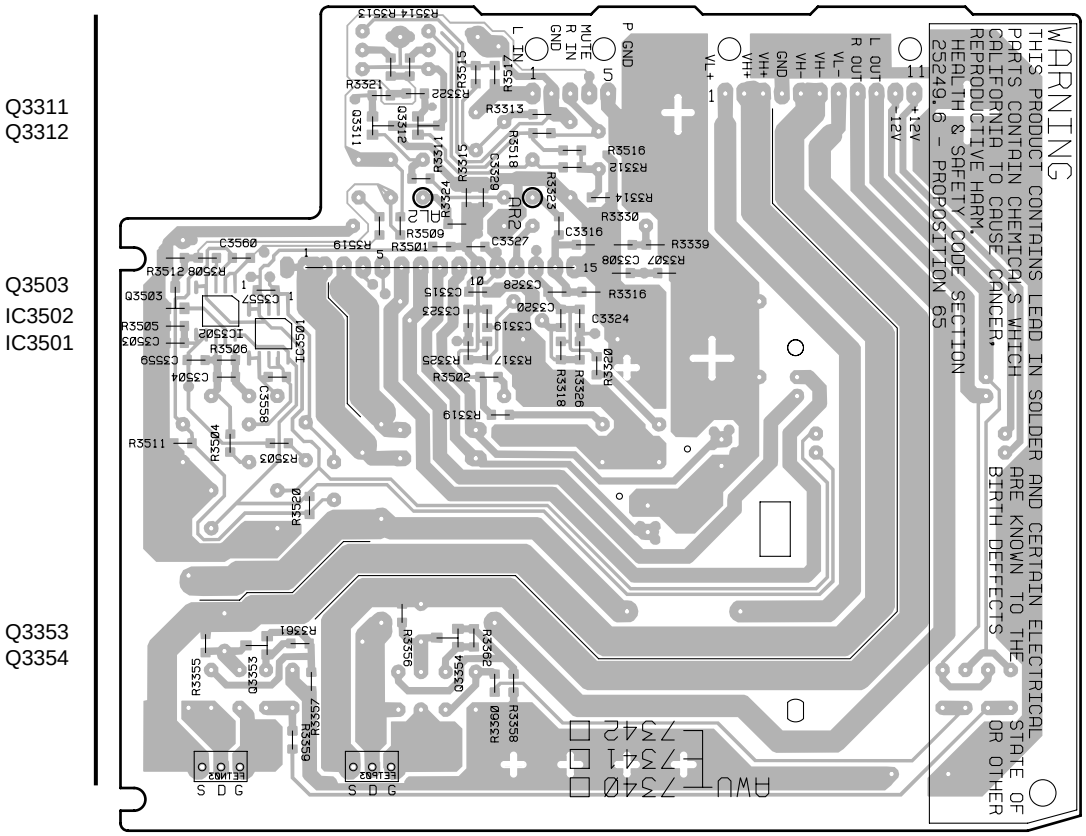


SIDE A
(ANP7300-C)



C

POWER SUPPLY ASSY



B

AMP ASSY

SIDE B

(ANP7300-C)

5. PCB PARTS LIST

NOTES:
- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 → 56 x 10^1 → 561 ..... RD1/4PU 5 6 1 J
47k → 47 x 10^3 → 473 ..... RD1/4PU 4 7 3 J
0.5 → R50 ..... RN2H R 5 0 K
1 → 1R0 ..... RS1P 1 R 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k → 562 x 10^1 → 5621 ..... RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
	■ LIST OF ASSEMBLIES		
NSP	MAIN ASSY		AWK7515
	├ AF ASSY		AWU7343
	├ AMP ASSY		AWU7342
	├ POWER SUPPLY ASSY		AWU7344
NSP	├ PRIMARY ASSY		AWU7348
NSP	├ SECONDARY ASSY		AWU7350
	├ HP ASSY		AWU7352
	├ METER ASSY		AWU7353
	└ METER CONNECT ASSY		AWU7356
	A AF ASSY		
	SEMICONDUCTORS		
⚠	IC82		NJM78M56FA
	Q3601, Q3621		2SA1037K
	Q3602, Q3603, Q3605–Q3608		2SC2412K
	Q81		2SD1859X
	Q3313, Q85		DTA124EK
	Q82		DTC124EK
	D3601, D3603–D3606, D3609, D3621		1SS133
	D3625, D3626, D3651, D3652		1SS133
	D85–D87		1SS133
⚠	D11, D21		D3SBA20(A)
	D3608		MTZJ5.6C
⚠	D31–D34, D41–D44		S5566G(TPB2)
⚠	D81–D84		S5688G
	COILS AND FILTERS		
	L1	LINE FILTER	ATF7020
	L3331, L3332	(1µH)	ATH-133
	TRANSFORMERS		
⚠	T1	STANDBY TRANSFORMER	ATT7049
	SWITCHES AND RELAYS		
	RY3601	SP RELAY/12V	ASR7008
⚠	RY81		ASR7018
	CAPACITORS		
⚠	C1–C3	(10000pF/AC250V)	ACG7020
⚠	C11, C12	(2200µF/71v)	ACH7117
	C3602, C84		CEAT100M50
	C83		CEAT1R0M50
	C3601		CEAT221M16
⚠	C82		CEAT221M25
⚠	C41		CEAT222M25
⚠	C31		CEAT222M35
	C3621		CEAT2R2M2A
⚠	C21, C22		CEAT332M50
	C3325		CEATR10M50
	C3331–C3334		CKSQYF104Z50
	C9011		CQMA102K2E
	RESISTORS		
	R1	(2.2MΩ/ 1/2W)	RCN1080
	R3333, R3334		RD1/4LMF100J
	R82		RD1/4PU220J
	R3601, R3602		RS3LMFR22J
	Other Resistors		RS1/10S□□□J
	OTHERS		
⚠	3101	12P CABLE HOLDER	51048-1200
⚠	CN3105	4PJUMPER CONNECTOR	52151-0410
	JA3333	2P PIN JACK	AKB7043
⚠	CN3332	10P SOCKET	AKP7048
⚠	CN3103	5P SOCKET	AKP7051
⚠	CN3106	11P SOCKET	AKP7052
⚠	CN3102	14P SOCKET	AKP7053
	H1, H2	FUSE CLIP	AKR7001
⚠	AN1	AC INLET 1P	AKP7032
	J3001	JUMPER WIRE	D20PYY1220E
	CN3331	4P SPEAKER TERMINAL	XKE3001
	B AMP ASSY		
	SEMICONDUCTORS		
	IC3501,IC3502		NJM4558MD
⚠	IC3301		STK407-070B
	Q3354		2SA1037K
	Q3353		2SC2412K
	Q3311, Q3312		2SD2114K
	Q3501, Q3502		2SK246
	Q3503		DTA124EK
⚠	Q3351		IRFI9Z34G
⚠	Q3352		IRFIZ34G
⚠	D3301, D3302		1SR139-100

Mark	No.	Description	Part No.
	D3351–D3354, D3361, D3362		1SS133
⚠	D3355, D3356		LT2A03
	D3357, D3358		MTZJ10C
⚠	D3359, D3360		MTZJ18B
	D3363, D3364		MTZJ39C
	CAPACITORS		
	C3319, C3320		CCSQCH100D50
	C3317, C3318		CEANP100M35
	C3313, C3314		CEANP2R2M50
⚠	C3303, C3304		CEAT101M50
	C3506–C3508		CEAT1R0M50
	C3501, C3502, C3509, C3510		CEAT470M25
	C3315, C3316		CKSQYB332K50
	C3503, C3504		CKSQYB682K50
	RESISTORS		
	R3353, R3354		RD1/4PU101J
	R3510		RD1/4PU104J
	Other Resistors		RS1/10S□□□J
	OTHERS		
⚠	CN3003	5P PLUG	AKM7010
⚠	CN3006	11P PLUG	AKM7011

C POWER SUPPLY ASSY

Mark	No.	Description	Part No.
	SEMICONDUCTORS		
⚠	IC33	PROTECTOR(1.25A)	AEK7048
⚠	IC42	PROTECTOR(2A)	AEK7067
	IC32		NJM4558MD
⚠	IC23		NJM7805FA
⚠	IC24		NJM7905FA
⚠	Q33, Q43		2SB1566
	Q32, Q3654, Q42		2SC1740S
	Q3652		2SC2412K
	Q3651		DTA143ES
	Q3653		DTC124EK
	D3654–D3656, D9021–D9024, D9026		1SS133
	D9029		1SS133
	D9030		MTZJ24B
	D36, D46		MTZJ3.0B
	D35, D45		MTZJ5.1B
	D9027, D9028		MTZJ6.8C
	CAPACITORS		
	C27, C28, C35, C45		CEAT100M50
	C3652		CEAT101M16
	C25, C26, C3651		CEAT1R0M50
	C3654		CEAT220M35
	C42, C43		CEAT470M16
	C32, C33		CEAT470M25
	C44		CKSQYB102K50
	C3653, C9027, C9028		CKSQYF104Z50

Mark	No.	Description	Part No.
	RESISTORS		
	R35		RD1/2LMF121J
	R45		RD1/2LMF910J
	R3659		RD1/2PM330J
	Other Resistors		RS1/10S□□□J
	OTHERS		
	CN3002	14P PLUG	AKM7012

D PRIMARY ASSY

PRIMARY assembly has no service part.

E SECONDARY ASSY

Mark	No.	Description	Part No.
	SEMICONDUCTORS		
⚠	IC41	PROTECTOR(3.5A)	AEK7017
⚠	IC31	PROTECTOR(4A)	AEK7018
⚠	IC21, IC22	PROTECTOR(5A)	AEK7019
⚠	IC11, IC12	PROTECTOR(7A)	AEK7021
	OTHERS		
	3001	12P CABLE HOLDER	51048-1200

F HP ASSY

Mark	No.	Description	Part No.
	RESISTORS		
	R3991, R3992		RS2LMF331J
	Other Resistors		RS1/10S□□□J
	OTHERS		
	3004	5P CABLE HOLDER	51048-0500
	3991	MINI JACK	AKN7003
	J3004	5P JUMPER WIRE	D20PYY0535E

G METER ASSY

Mark	No.	Description	Part No.
	SEMICONDUCTORS		
	IC5601		NJM4558MD
	Q5601		2SA1037K
	Q5602		DTA124EK
	Q5603, Q5604		DTC124EK
	D5601, D5605, D5606		1SS133
	D5608		MTZJ10B
	D5604		MTZJ12B
	D5607		MTZJ5.1B
	CAPACITORS		
	C5603, C5607		CEAT1R0M50
	C5604, C5605		CKSQYF104Z50
	RESISTORS		
	All Resistors		RS1/10S□□□J

Mark	No.	Description	Part No.
OTHERS			
	5601	3P CABLE HOLDER	51048-0300
	3005	4P CABLE HOLDER	51048-0400
	J3005	4P JUMPER WIRE	D20PYY0410E

H METER CONNECT ASSY

SEMICONDUCTORS			
	D5603		MTZJ5.6C
	D5602		NSPBF50S-8451
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	5602	3P CABLE HOLDER	51048-0300
	J5601	3P JUMPER WIRE	D20PYY0315E

6. ADJUSTMENT

There is no information to be shown in this chapter.

7. GENERAL INFORMATION

7.1 SINGLE OPERATION METHOD

Single operation method and inputlevel.

The procedure and the input level of a single operation are shown below.

1. R85 are shorted by 1kΩ.
2. A point of the figure below in four places is connected.

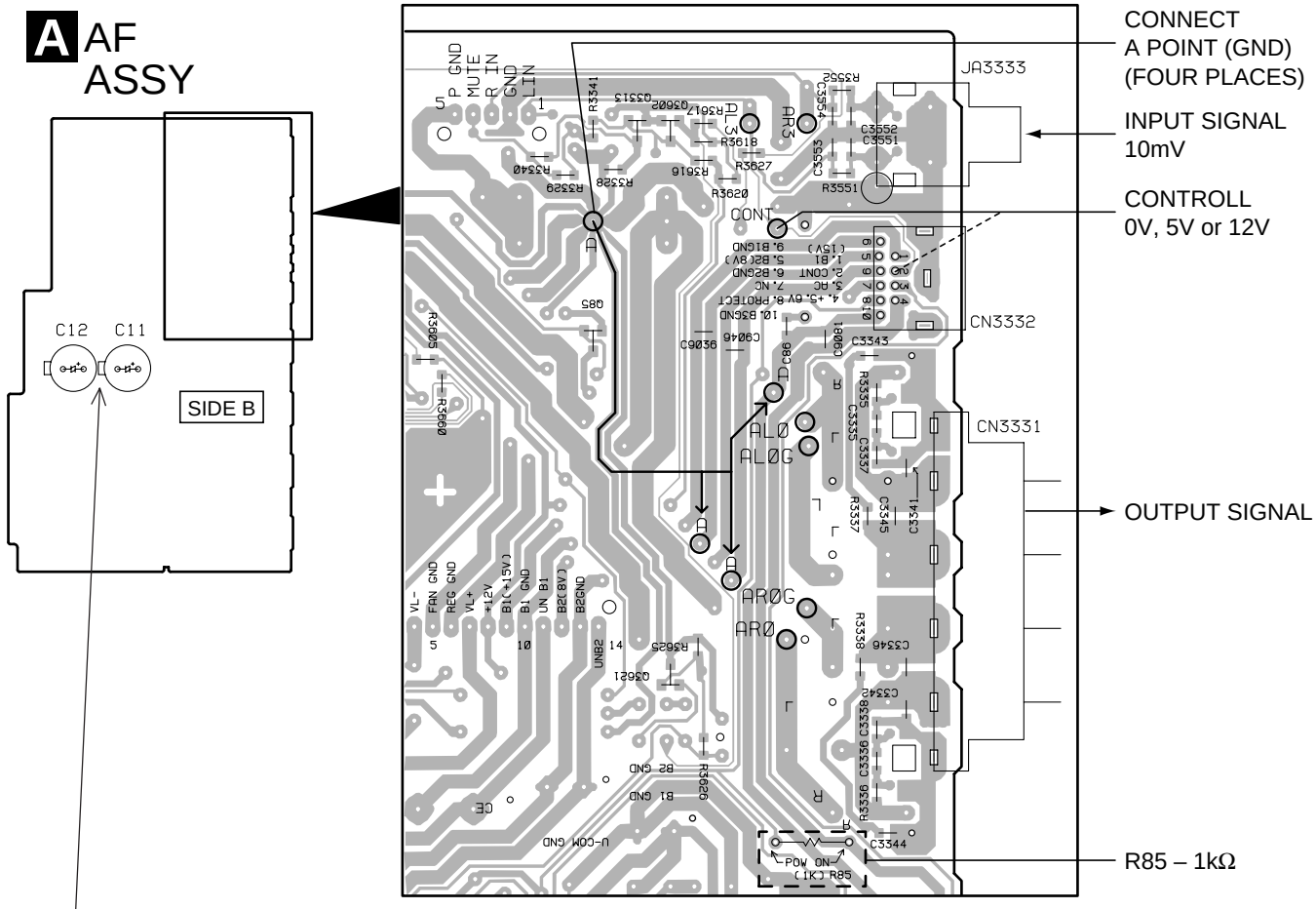
   GND is not common because it is independent with chassis GND (GND of the amplifier), B1GND, B2GND, and B3GND.

   The potential of B1GND, B2GND, and B3GND is done by connecting A point in four places as well as chassis GND.
2. The power supply of the product is turned on.
3. the terminal CONT (2 pin of CN3332) are controlled respectively by the following voltages.

	CONT		
	12V	5V	0V
RY	ON	ON	OFF
MUTE	OFF	ON	ON

4. The signal of 10mV is input from input terminal (JA3333), and the output is confirmed with speaker terminal (CN3331).

   Note : If the music signal is input directly to input terminal (JA3333) with CD PLAYER etc. , the output becomes a large volume because there are 40dB GAIN of the amplifier.



Caution when disassemble.
Even if the power supply code is pulled out from the outlet, neither C11 nor C12 of AF ASSY are discharged.
Please discharge C11 and C12 of AF ASSY by the resistor of 100 Ω or more before removing AF ASSY or POWER SUPPLY ASSY.
There is a possibility to destroy the transistor, and Please discharge by the resistor of 100 Ω or more.

8. PANEL FACILITIES AND SPECIFICATIONS

● PANEL FACILITIES

㉜ **POWER OUTPUT METER**

㉝ **PHONES jack**

● SPECIFICATIONS

■ **Amplifier Section**

Continuous average power output of 55 watts* per channel, min., at 6 ohms, from 60 Hz to 15,000 Hz with no more than 1.0 % total harmonic distortion.**

* Measured pursuant to the Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.

** Measured by Audio Spectrum Analyzer.

■ **Micellaneous**

Power Requirements ..... AC120 V, 60 Hz
Power Consumption ..... 120 W, 160 VA
Power Consumption in standby mode ..... 1 W
Dimensions:
Power Amplifier ..... 150 (W) x 300 (H) x 233 (D) mm
5-7/8 (W) x 11-13/16 (H) x 9-3/16 (D) in.
Weight:
Power Amplifier ..... 4.0 kg (8 lb 13 oz)

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.